

CLAIMS

1. A micropump utilizing gas generation comprising:
a silicon substrate having a reservoir for H₂O₂
5 solution formed therein;
a SiO₂/Si₃N₄ film formed on the silicon substrate; and
a PDMS combined on the SiO₂/Si₃N₄ film,
wherein the PDMS includes a reservoir for MnO₂
10 confronting the reservoir for H₂O₂ solution on the other
side of the SiO₂/Si₃N₄ film, a sample reservoir connected to
the reservoir for MnO₂ through a conduit, a sample injection
opening connected to an end of the sample reservoir, and a
minute channel leading to an exterior of the micropump from
another end of the sample reservoir.
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2. A production method of a micropump utilizing gas
generation, comprising the steps of:
forming a reservoir for MnO₂, a sample reservoir
connected to the reservoir for MnO₂ through a conduit, a
20 sample injection opening connected to an end of the sample
reservoir, and a minute channel leading to an exterior of
the micropump from another end of the sample reservoir by
forming a negative photoresist SU-8 layer and patterning on
a silicon substrate;
25 forming a PDMS on the SU-8 layer;
forming a SiO₂ film and a Si₃N₄ film sequentially on
another silicon substrate;
forming a reservoir for H₂O₂ solution by etching the
bottom surface of the silicon substrate having the SiO₂ film
30 and the Si₃N₄ film formed thereon;
securing a bottom plate to the bottom of the reservoir
for H₂O₂ solution; and
combining the PDMS on the silicon substrate having the
reservoir for H₂O₂ solution formed therein after removing
35 the PDMS from the silicon substrate and SU-8 pattern.

3. A micropump utilizing gas generation comprising:
 - a bottom plate constituting a bottom surface;
 - a hot-wire formed inside a reservoir on the bottom plate; and
 - a PDMS combined on the bottom plate,
wherein the PDMS includes the reservoir, a sample reservoir connected to the reservoir through a conduit, a sample injection opening connected to an end of the sample reservoir, and a minute channel leading to an exterior of the micropump from another end of the sample reservoir.
4. The micropump utilizing gas generation of claim 3, further comprising a paraffin layer mixed with MnO₂ powder formed on the hot-wire,
wherein the reservoir reserves H₂O₂ solution.
5. The micropump utilizing gas generation of claim 3, wherein the reservoir reserves NaHCO₃ solution.
6. The micropump utilizing gas generation of claim 3, further comprising a water droplet enveloped in a Parafilm arranged on the hot-wire,
wherein the reservoir reserves a mixture of NaHCO₃ and HOC(COOH)₂(CH₂COOH)₂.
7. A production method of a micropump utilizing gas generation, comprising the steps of:
 - forming a hot-wire inside a reservoir on a bottom plate;
 - combining a PDMS having the reservoir formed therein on the bottom plate; and
 - combining another PDMS including a sample reservoir connected to the reservoir through a conduit, injection openings respectively connected to each ends of the

reservoir and the sample reservoir, and a minute channel leading to an exterior of the micropump from another end of the sample reservoir on the PDMS having the reservoir formed therein.

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8. A cell culture unit utilizing gas generation comprising:

- a bottom plate constituting a bottom surface;
- a hot-wire formed inside a reservoir for holding NaHCO_3 10 on the bottom plate;
- a PDMS including the reservoir formed by combining the PDMS on the bottom surface and an air supply line connected to the reservoir through a conduit;
- a thin permeable PDMS film arranged on the PDMS; and
- 15 a PDMS cover being combined on the PDMS film and having an engraved media-line confronting the air supply line on the other side of the PDMS film.